

Amendments To The Claims

Please cancel Claim 7 without prejudice. The following list of the claims replaces all prior versions and lists of the claims in this application.

1. (Currently amended) A method of forming a strained semiconductor layer, comprising the steps of:
 - providing a first wafer with a surface comprising of a first semiconductor layer of a first natural lattice constant, wherein said first semiconductor layer is an alloy semiconductor layer comprising silicon and germanium, with a Ge mole fraction between about 5 to 80%;
 - forming a second semiconductor layer with a second natural lattice constant on the first semiconductor layer, said first and second natural lattice constants being different so as to introduce a strain gradient at the interface of said second semiconductor layer and said first semiconductor layer;
 - providing a second wafer with a surface with or without an insulator layer;
 - bonding said second semiconductor layer on said surface of said second wafer, resulting in a third wafer comprised of said second wafer, said second semiconductor layer, and said first wafer; and
 - performing a water jet cleaving procedure at said strain gradient so that said second semiconductor layer is separated from said first semiconductor layer and said first wafer due to cleaving facilitated by said strain gradient.

2. (Original) The method of claim 1, wherein said second wafer is a single crystalline silicon substrate.

3. (Original) The method of claim 1, wherein said second wafer is a single crystalline silicon substrate with an overlying insulator layer formed on it.

4. (Original) The method of claim 3, wherein said insulator layer is a silicon dioxide layer.
5. (Original) The method of claim 3, wherein said insulator layer is a silicon nitride layer.
6. (Previously presented) The method of claim 1, wherein said first semiconductor layer has a lattice constant greater than that of said second semiconductor layer.
7. (Canceled).
8. (Currently amended) The method of claim 1, wherein said first semiconductor layer is ~~an alloy semiconductor layer comprising silicon and germanium~~, epitaxially grown to a thickness between about 0.1 to 10 microns, ~~with a Ge mole fraction between about 5 to 80%.~~
9. (Original) The method of claim 1, wherein said second semiconductor alloy layer is a silicon layer under tensile strain.
10. (Original) The method of claim 1, wherein said second semiconductor layer is a silicon layer, epitaxially grown to a thickness between about 20 to 1000 Angstroms.
11. (Currently amended) A method of fabricating a metal oxide semiconductor field effect transistor (MOSFET) device on an insulator layer, featuring a silicon channel region, comprising the steps of:

providing a first wafer with a surface comprising of a first semiconductor material of a first natural lattice constant, wherein said first semiconductor material is an alloy semiconductor layer that includes silicon and germanium, with a Ge mole fraction between about 5 to 80%;

forming a second semiconductor layer with a second natural lattice constant on the first semiconductor material so that said second semiconductor layer is strained, said first and second natural lattice constants being different so that a large strain gradient is formed at the interface of said second semiconductor layer and said first semiconductor material;

providing a second wafer comprising a substrate with an overlying insulator layer;

bonding said second semiconductor layer on said second wafer, with an insulator in between, resulting in a third wafer comprised of said second wafer, said second semiconductor layer, and said first wafer;

performing a compressed air or pressurized fluid cleaving procedure at said strain gradient so that said second semiconductor layer is separated from said first semiconductor material due to cleaving facilitated by said strain gradient, resulting in a fourth wafer comprised of said second semiconductor layer and said second wafer; and

forming a MOSFET device on said fourth wafer, comprising a gate structure and source and drain regions located adjacent to said gate structure.

12. (Original) The method of claim 11, wherein said second wafer is a silicon wafer with an insulator formed on it.

13. (Original) The method of claim 12, wherein said insulator layer is a silicon dioxide layer.

14. (Original) The method of claim 12, wherein said insulator layer is a silicon nitride layer.

15. (Currently amended) The method of claim 11, wherein said ~~first semiconductor material is an~~ alloy semiconductor layer ~~comprising~~ has the silicon and germanium thereof in a relaxed state.

16. (Original) The method of claim 15, wherein said alloy semiconductor layer is obtained by epitaxial growth procedures.

17. (Currently amended) The method of claim 15, wherein said alloy semiconductor layer is epitaxially grown to a thickness between about 0.1 to 10 microns, ~~with a Ge mole fraction between about 5 to 80%.~~

18. (Original) The method of claim 11, wherein said semiconductor layer is a silicon layer.

19. (Original) The method of claim 18, wherein said silicon layer is epitaxially grown to a thickness between about 20 to 1000 Angstroms.

20. (Currently amended) A method comprising:
providing a first wafer having a first semiconductor layer with a first natural lattice constant, said first semiconductor layer being an alloy semiconductor layer that includes silicon and germanium, with a Ge mole fraction between about 5 to 80%;

forming a second semiconductor layer with a second natural lattice constant on the first semiconductor layer, said first and second natural lattice constants being different so as to form an interface with a large strain gradient;

bonding a second wafer on said second semiconductor layer; and

directing a pressurized fluid jet at said strain gradient so that said second semiconductor layer is separated from said first semiconductor layer and said first wafer due to cleaving facilitated by said strain gradient.

21. (Currently amended) The method of claim 20, wherein ~~bonding a~~ bonding the second wafer comprises bonding an insulator layer ~~on a~~ on the second wafer to the second semiconductor layer of the first wafer.

22. (Canceled).

23. (Currently amended) The method of claim 20, wherein ~~providing a~~ providing the first wafer comprises ~~providing a~~ configuring the first wafer ~~having to have~~ a silicon substrate, a relaxed SiGe layer formed thereon, and a strained silicon layer formed on the SiGe layer.